

## REMARKS

Claims 1-28 are pending, with claims 1, 15 and 16 being independent. Claim 29 was cancelled by a previous preliminary amendment without waiver or prejudice. Claims 5 and 15 are amended by this amendment. No new matter is added.

Applicant's responses to specific rejections are presented below following excerpted text of the Office action, which is presented in indented, bold, single-spaced, 9 point font.

### **Claim Objections**

**5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.**

**The following title is suggested: System and Method for Boolean expression Query Optimization.**

Applicant has amended the title as suggested by the Office: Method and System for Boolean Expression Query Optimization. For at least this reason, Applicant respectfully requests reconsideration and withdrawal of the objection to the title.

### **Claim Rejections - 35 USC § 112**

**7. Claim 5 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 5 recites initializing the relationship vector as including a LESS THAN component, an EQUAL TO component and/or a GREATER THAN component. However, "and/or" is not disclosed.**

Applicant has amended claim 5 to obviate the rejection by replacing the "and/or" with "or". For at least this reason, Applicant respectfully requests reconsideration and withdrawal of the § 112, first paragraph rejection of claim 5.

### **Claim Rejections – 35 USC § 101**

**8. Claim 15 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims fail to place the invention squarely within one statutory class of invention. On page 22 and 24 of the instant specification, applicant has provided evidence that applicant intends a "medium" to include "medium of digital data communication", see page 24. On page 22, it states "a computer program tangibly embodied in an information carrier, e.g. in a machine readable storage device or in a propagated signal". As such, the claim is drawn to a form of energy. Energy is not one of the four categories of invention and therefore this claim(s) is/are not statutory. Energy is not a series of steps or acts and thus is not a process. Energy is not a physical article or object and as such is not a machine or manufacture. Energy is not a combination of Substances and**

**therefor not a composition of matter. Applicant's are suggested to amend computer-readable medium to be "computer-readable storage medium".**

Applicant has amended claim 15 to obviate this rejection. Applicant has amended claim 15 to recite "computer-readable storage medium", as suggested by the Office.

For at least this reason, Applicant respectfully requests reconsideration and withdrawal of the § 101 rejection of claim 15.

**9. Regarding claims 16-28, in particular claim 16, the claim recites a "processor" and "memory". In the absence of any modifying disclosure of this limitation in the specification, the examiner interprets the term 'processor' as limited to hardware embodiments; and the term 'program storage device' as excluding printed paper, transmission media, signals, or any form of energy, such that the claim clearly falls within a statutory class of invention as required under the terms of 35 U.S.C. 101.**

Applicant submits that claims 16-28 do not stand rejected under 35 U.S.C. § 101 and that claims 16-28 recite statutory subject matter without amendment. Furthermore, Applicant does not acquiesce to the Examiner's interpretation of the terms "processor" and "program storage device" and submits that the terms are not necessarily limited as interpreted by the Examiner. The scope of the claims is defined by the language of the claims, not the language of the specification. Applicant submits that the language of the claims is statutory without the interpretation of the terms from the Examiner.

#### **Claim Rejections - 35 USC § 103**

**11. Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6439783 by Gennady Antoshenov (hereafter Antoshenov) further in view of U.S. Patent 5666528 by Lam H. Thai (hereafter Thai).**

##### **Claim 1 :**

**Antoshenkov discloses the following claimed limitations:**

**"receiving the Boolean expressions;"[col. 8 line 9, a query may be a Boolean expression. Accordingly, receiving the Boolean expressions (query)]**

**"decomposing the Boolean expression into the plurality of conditions;"[abstract, the query is converted to a Boolean tree in canonical form. Col. 8 lines 66-67, a Boolean tree which has been constructed from the following query: ((s1>21) and (s2=140000)) or not((s1<=30) or not(s2 >20000) or (s2/1000<>s1)). Accordingly, decomposing (constructed) the Boolean expression (query) into the plurality of conditions (figure 4a and ((s1>21) and (s2=140000)) or not((s1<=30) or not(s2 >20000) or (s2/1000<>s1)))]**

**"for each condition of the plurality, extracting from the condition at least one condition value referring to the attribute, wherein the at least one condition value defines a value range of the condition;"[ Col. 8 lines 66-67. Accordingly, for each condition of the plurality(((s1>21) and (s2=140000)) or not((s1<=30) or not(s2 >20000) or (s2/1000<>s1))), extracting from the condition at least one condition value referring to the attribute (s1, s2), wherein the at least one condition value defines a value range of the condition (>21, =14000, <=30, etc.)]**

"inserting the at least one condition value in a condition value list in sorted order;" [col. 7 lines 2-5, the results of the evaluation are placed in the range vector. The rank vector is sorted by the range values, and each range is given a rank number. Accordingly, inserting (placed) the at least one condition value (range) in a condition value list (rank vector) in sorted order (sorted range values).]

"initializing a relationship vector for the at least one condition value; and"[figure 4b and figure 10]

"wherein each component in the relationship vector is a counter and initializing the relationship vector comprises setting the counter for each of the components to an initial value"

"adjusting the relationship vectors for the at least one condition value and for each further condition value that is in the condition list and that is in the value range of the condition." [col. 7 lines 8-1 5. Accordingly, adjusting the relationship vectors (boolean tree is further optimized) for the at least one condition value (range) and for each further condition value (ranges) that is in the condition list (rank vector) and that is in the value range of the condition (range values)]

Antoshnev does not explicitly disclose "wherein each component in the relationship vector is a counter and initializing the relationship vector comprises setting the counter for each of the components to an initial value" and "adjusting the counters"

On the other hand, Thai discloses col. 10 lines 5-10, system still creates a bitmap; each bit is set equal to 1(i.e. it is assumed at the outset that all records meet the specified query condition). As the table is scanned, records determined to not meet the query condition are removed from the bitmask (e.g. their corresponding bit is toggled from 1 to 0).

Accordingly, disclosing wherein each component (bit) in the relationship vector (bitmap) is a counter (toggled 1 to 0; set equal to 1) and initializing the relationship vector comprises setting the counter for each of the components to an initial value (each bit is set equal to 1).

Accordingly, "adjusting the counters"(toggled 1 to 0; set to 1)

Both Antoshnev and Thai are within the same field of endeavor as applicant's invention. Antoshnev scanning and evaluating the record; however does not provide for storing any of the resulting true false condition for the record. Thai discloses a bitmap in order to further optimize a query by learning which records meet filtered conditions. It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to have applied Thai's disclosure above to Antoshnev's for the purpose of storing whether conditions records meet the filter condition, in doing so, improves upon Antoshnev's disclosure by having already learned optimization method for on-the-fly learning of records which meet filter conditions.

Applicant respectfully disagrees. As acknowledged in the Office Action, Antoshnev does not disclose "wherein each component in the relationship vector is a counter and initializing the relationship vector comprises setting the counter for each of the components to an initial value" and "adjusting the counters." Thus, Antoshnev does not describe counters or adjusting the counters.

Applicant submits that Thai also does not disclose that each component in the relationship vector is a counter and adjusting the counters. The Office asserts that a bit in a bitmap that is toggled from 1 to 0 is a counter and that toggling the bit from 1 to 0 is adjusting the counters. Applicant respectfully disagrees. A bit in a bitmap that is toggled from 1 to 0 is not a counter and toggling the bit from 1 to 0 is not adjusting the counters.

A person skilled in the art would readily understand that a bit in a bitmap that is toggled from 1 to 0 is not a counter. The Microsoft Computer Dictionary defines a counter as "[i]n

programming, a variable used to keep count of something.” See Microsoft Computer Dictionary Fifth Edition p. 131 (2002). A bit in a bitmap that is configured to toggle back and forth between 1 and 0 is not capable of keeping count of something. When the bit in the bitmap is adjusted (i.e., toggled), the bit is not incremented, but just changed back to the opposite state. If the bit is adjusted (i.e., toggled) many times, there would be no way of knowing how many times the bit has been adjusted. In contrast, each time a counter is adjusted, the counter may be incremented to keep count of the number of adjustments. The bit in the bitmap that is only toggled back and forth, as described in Thai, is just not capable of keeping count of anything.

Claim 1 explicitly recites a counter and adjusting the counter. Antoshnev and Thai, either alone or in combination, do not describe, suggest or render obvious “wherein each component in the relationship vector is a counter and initializing the relationship vector comprises setting the counter for each of the components to an initial value” and “adjusting the counters,” as recited in independent claim 1.

For at least these reasons, Applicant respectfully requests reconsideration and withdrawal of the § 103 rejection of independent claim 1 and its dependent claims 2-14.

Similarly to claim 1, independent claims 15 and 16 recite a computer program product (claim 15) and a computer system (claim 16) that recite a processor that is configured to initialize a relationship vector for the at least one condition value, where each component in the relationship vector is a counter, the processor sets the counter for each of the components to an initial value and adjusts the relationship vectors for the at least one condition value and for each further condition value that is in the condition list and that is in the value range of the condition by adjusting the counters. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the § 103 rejection of independent claims 15 and 16 and claims 17-28, which depend from independent claim 16.

## **Conclusion**

Applicant respectfully submits that the claims are in condition for allowance. The Examiner is invited to telephone Applicant’s attorney (202-470-6457) to facilitate prosecution of this application.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as intended to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

No fees are believed to be due. If necessary, please charge any deficiencies or credit any overpayment to Deposit Account No. 50-3521, referencing Attorney Docket No. 2003P00256WOUS/0010-017001.

Respectfully submitted,  
Brake Hughes Bellermann LLP  
Customer Number 56056  
202-470-6457

/Joseph F. Key, Reg. No. 44827/

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Joseph F. Key  
Reg. No. 44,827